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## **Synchrotron Powder Diffraction Simplified: the High-resolution Diffractometer 11-BM at the Advanced Photon Source**

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Synchrotrons have revolutionized powder diffraction. They enable the rapid collection of high quality powder diffraction patterns with tremendous resolution and superb signal to noise. The high penetration and exceptional data sensitivity possible at high-energy light sources like the Advanced Photon Source (APS) allow synchrotrons to explore trace containment levels, extreme sample environments, and crystallographic site occupancies. Despite these advantages, relatively few scientists today consider using a synchrotron for routine powder diffraction studies.

To address this, the new synchrotron powder diffractometer beamline 11-BM at the APS now offers rapid and easy mail-in access for routine structural analyses with truly world-class quality data. This instrument offers the highest resolution available in the Americas and is a free service for non-proprietary users. The instrument can collect a superb pattern suitable for Rietveld analysis in less than an hour, is equipped with a robotic arm for automated sample changes, and features variable temperature sample environments. Users of the mail-in program receive high-resolution data within two weeks of sample receipt. The diffractometer is also available for on-site experiments that require more specialized measurements.

Our presentation will describe the instrument, highlight its capabilities, and explain the types of measurements currently available. More information about the 11-BM diffractometer and its mail-in program is available at <http://11bm.xor.aps.anl.gov>.